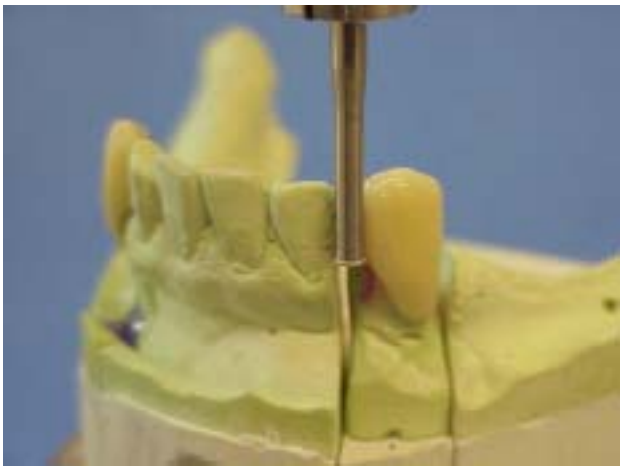
Peterson Area Dental Laboratory Information Letter

10th Dental Squadron/USAFA, Colorado 25 February 2000

Design and Fabrication of Surveyed Crowns

The need for a cast restoration on the abutment tooth of a removable partial denture (RPD) requires careful, all-inclusive diagnosis and well-designed treatment planning by the restorative dentist. Surveyed crowns are the cornerstones of a stable and retentive removable prosthesis that must be designed and planned for during the initial phases of dental treatment. Your Peterson Area Dental Laboratory (ADL) has lots of experience in fabricating well-fitting restorations that will support and retain a RPD. And with proper planning on your part, the selected treatment will likely have a successful outcome based on the esthetic and functional needs of the patient.



Surveyed crowns #22 and 27 undergo final ADL inspection to ensure undercuts, guide planes and rest seats are placed according to prescription.

Treatment Planning: The need for a crown on a RPD abutment tooth may result from causes such as caries, fractures, defective existing restorations, negative tooth vitality, and poor shape or angulation. Surveyed crowns require significant comprehensive diagnosis and treatment planning before ever considering tooth preparation for the fixed restoration. As with all complex cases, accurate diagnostic casts should follow a comprehensive clinical examination. The patient's pulpal and periodontal health and any required treatment should be determined in support of the patient's restorative needs. New periapical radiographs should be made of all teeth evaluated for surveyed crowns and recent radiographs made available of the remaining dentition to supplement treatment planning.

The RPD framework should be surveyed, designed and completely outlined on the diagnostic casts. A surveyor is a necessity….don't leave home without it! The surveyed crown restorations should be planned to fit the pre-determined RPD design. At this point, all other periodontics, endodontics, oral surgery, operative dentistry, etc., should be accomplished before rendering definitive fixed or removable prosthodontic treatment.

Removable Partial Denture Rest Preparations:

After survey and design of the diagnostic casts, prepare all RPD rest preparations and guide planes on the patient. It is important to do this for two reasons. First, it is a lot easier for the dental laboratory to wax a surveyed crown to your already prepared guide planes and rest seats than it is trying to cut preparations in the mouth after the crown is inserted. And second, the final impression of the surveyed crowns allows you a "free" look at the rest preparations etc., and a chance to make corrections before the RPD final impression is made.

Retainer Tooth Preparation: The tooth preparations for the surveyed crowns may now be accomplished. Be sure to prepare the tooth with the RPD path of withdrawal in mind. The surveyed crown may not necessarily follow the long axis of the tooth because of the path required for the RPD. Axial surfaces may need to be reduced more than normal in order to achieve proper room for adequate undercuts, reciprocation, and guideplane formation. Additionally, resistance and retention in the form of boxes, grooves and potholes may be required to resist the stress of the RPD clasp assembly.

For rest seats, 2.0-2.5 mm reduction is required at the marginal ridge areas. The rest seat should be spoon shaped with further reduction at the base of the seat. This clearance allows for a minimum crown thickness of 1.0 mm in the occlusal rest seat and 1.0-1.5 mm for the RPD metal framework at the marginal ridge. 2.0-2.5 mm

clearance is required at the base of the occlusal rest seat. This reduction is especially important on anterior teeth such as maxillary canines. We often see under-reduction in these regions which result in the crowns being overcontoured. Make a full arch final impression that captures not only the crown preparation, but that accurately reproduces the contours and preparations of the other RPD abutment teeth.

Provisional Restorations: Allow adequate time for this procedure. Provisional restorations made under existing RPDs are best made by making a coping that is not touched by the seated denture, then brush beading the acrylic resin within the clasp assembly to final contour.

***Wax Pattern Fabrication*:** After normal contour has been established in the wax, the cast is removed from the articulator and placed on the surveyor. The original path of withdrawl is re-assessed. When the cast tilt for final path of placement has been selected, the cast is marked at three points. The "tripodizing" allows the re-establishment of the selected path. Final evaluation of the surveyed contours is made by dusting the pattern with waxing powder. The height of contour is marked with the analyzing rod and the undercut measured with the appropriate gauge.

Guide planes should be prepared and evaluated. As a rule of thumb, guide planes should be about 2/3 as wide as the distance between the tips of adjacent buccal and lingual cusps and should extend vertically about 2/3 the length from the marginal ridge to the gingival tissue.

Occlusal rest seats are made with a discoid carver and measured to assure at least 1.0 mm thickness of wax. The outline form of the occlusal rest seat should be "rounded" triangular shape (spoon-shaped) with the apex toward the center of the occlusal surface. The rest seat should be as long as it is wide, and the base of the triangular shape should be at least 2.5 mm. The marginal ridge of the abutment crown at the site of the rest seat must allow sufficient bulk of metal for strength and rigidity of the RPD rest and minor connector. This means there should be clearance of 1.0-1.5 mm at the marginal ridge and 2.0-2.5 mm at the rest seat base. Avoid sharp edges or line angles in the wax-up.

The angle formed by the occlusal rest and the vertical minor connector should be less than 90^{o}.

Cast Gold Surveyed Crowns: Cast gold crowns are re-evaluated on the surveyor prior to patient try-in. Ensure that proper contours, undercuts, etc. have not been polished away or otherwise altered during the casting procedure.

Cast crowns are tried in the patient and adjustments made for fit and occlusion. Castings may be picked up with alginate, then slurry stone poured into the impression and lubricated crowns. This solid pick-up impression allows additional surveillance of contours. Alternatively, the crowns may be removed from the pick-up impression and simply poured as usual. However, this procedure only allows one reliable adjustment of the crowns

Metal Ceramic Surveyed Crowns: Retentive arms can be successfully placed on glazed porcelain. Rest seats, guide planes, and lingual bracing arms are best placed in metal. Rest seat should be located in metal at least 1.0 mm from the metal ceramic junction.

Resin-Veneered Surveyed Crowns: Traditionally, these are not indicated. However, the exception may be with resin-veneered crowns opposing resin teeth of a complete or partial denture. In this case allowance should be made on the crowns for the RPD denture clasp tip to rest against a window of metal.

One final note: before sending your case to the ADL, please take a moment to critique your own tooth preparations to verify you have met reduction and clearance guidelines. If these guidelines have not been met, please consider re-preparing the teeth. Otherwise, you risk receiving surveyed restorations that are over-contoured or high in occlusion. Providing us with good tooth preparations will help us provide you with the very best restorations possible!

BGen (Sel) Murray Visits ADL

BGen (Sel) Murray presents an Achievement Medal to SSgt Patricia E. Murphy. Achievement Medals were also presented to TSgt Robert E. Pfeifer and SSgt Kenneth V. Cammarato.

The ADL recently welcomed BGen (Sel) Gary H. Murray, Commander, Air Force Medical Operations Agency and Assistant Surgeon General for Dental

Services to Peterson AFB. BGen (Sel) Murray toured the facilities and met with ADL personnel to not only see new technical procedures and streamlined production operations, but also to better understand dental laboratory issues and concerns.

We appreciate BGen (Sel) Murray taking time from his busy schedule to address the ADL troops and make presentations to the staff. Achievement Medals were presented to TSgt Robert E. Pfeifer, SSgt Kenneth V. Cammarato and SSgt Patricia E. Murphy on behalf of the 10th Medical Group.

QC Forms: Your "Bridge" to Success in Fixed Prosthodontics

by MSgt Francisco Pizana,Jr.
NCOIC ADL Fixed Department

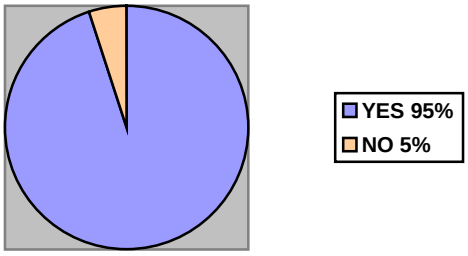
Allow me to introduce myself, I'm MSgt Franciso Pizana, Jr. the NCOIC of the Fixed Department at your CONUS ADL, located at Peterson AFB in beautiful Colorado Springs, Colorado. As the NCOIC of the Fixed Department, I will write articles in future ADL Newsletters addressing important issues of the fixed department. These articles will address your questions, concerns and other dental laboratory issues The purpose is to improve communication and increase the service we provide you, the customer!

I would like to start off by strongly encouraging you to fill out and return the Peterson ADL's Quality Control Form. You may have noticed we recently redesigned our quality feedback forms to improve communications between you and the ADL. Your feedback is very important to us, no matter whether it is positive or negative. We learn from both! Last fiscal year, 55% of the Quality Control Forms were returned to the ADL from the field. This year the response has not been as great. Please note the low QC return rate on the ADL Report Card below. The good news was that 93% of our fixed dental prostheses were inserted and only 7% were remakes. Please indicate whether the remake was due to clinical or laboratory error. The staff of the fixed department is dedicated to fabricating the highest quality restorations possible. With your help, by providing timely and accurate feedback, we can ensure our products meet and exceed your expectations.

If you have any immediate questions or concerns, please feel free to contact me at DSN 834-1600 or via e-mail: francisco.pizana@peterson.af.mil.

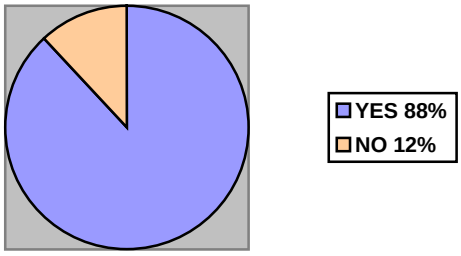
ADL Report Card:
Customer Satisfaction Rate
FY 2000 1st Qtr

Fixed Restorations…were you satisfied with the Quality?



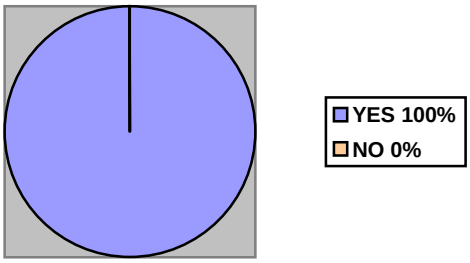
Fixed QC Response Rate: 242 of 900 cases or 27%

Removable Frameworks…were you satisfied with the Quality?



Removable QC Response Rate: 58 of 300 cases or 19%

Acrylic Restorations…were you satisfied with the Quality?



Acrylic QC Response Rate: 59 of 219 cases or 27%

Chrome Corner…Rappin' about RAPs

by MSgt Robert Berkeley, NCOIC Removable Partial Dentures

A major area of concern for the Removable Partial Denture Department is the matrices for RAP (Reinforced Acrylic Pontics) fabrication that we receive from various base laboratories. Some problem areas are matrices being very bulky and/or made of flexible material such as Reprosil. Both problems create inaccurate matrices.

We prefer that the matrix be made of dental stone. It should be 2.0 mm thick over the incisal edges of RAP and adjacent natural teeth. The matrix should include the lingual-incisal line angles of all teeth but should not extend onto the lingual surfaces of any teeth. It should extend 2/3 down the facial surfaces of the teeth toward the gingival margin. It is crucial that it horizontally cover at least ¾ of the width of the facial surface of the adjacent natural teeth.

Another problem we commonly see with requests for RAP fabrication is that no acrylic teeth are sent with the case. The base laboratory is required to fit the acrylic resin teeth to the edentulous ridge so that the prescribing dentist can verify the color, contour and position of the RAP teeth before the ADL fabricates the metal RPD framework. Also, please check the occlusion and both lingual and facial alignment prior to shipping to the ADL. In order to produce the best prosthesis possible for the patient, we request that these guidelines be followed.

For questions, you can reach me at the following address: robert.berkeley@peterson.af.mil

Acrylic Shavings…

Orthosis Fabrication

By TSgt Richard Torres, NCOIC Acrylic Resin

In order for us to better serve you and your patients and provide the highest quality appliance possible, please include interocclusal records with clean, accurate casts when submitting a case for orthosis fabrication.

Most cases are mounted in maximum intercuspation (MI), but there are times when the occlusion is in question. Accurate casts with stone nodules removed from the occlusal surface are a must. Additionally, interocclusal records are needed to ensure accurate mounting of the casts and provide the best opportunity for accurate fit of the appliance.

When fabricating the orthotic appliance, vertical dimension of occlusion is opened a minimum of 2.0 mm at the closest point to allow space for acrylic resin. If more of an opening is desired, please include an interocclusal record made at the desired vertical dimension of occlusion. This will allow us to make the appliance at the desired thickness. If slight variation is requested from the interocclusal record, please annotate on the DD Form 2322.

These hints may reduce insertion adjustments and clinical chairtime, while increasing patient comfort and satisfaction.

As always, your feedback is important and appreciated. Please return our Quality Control forms with any comments or concerns.

richard.torres@peterson.af.mil

Chief's Comments

By CMSgt Michael Bonner, Manager, ADL

If you're a SrA or SSgt looking for a change of pace, the Peterson ADL is currently advertising assignments on Equal Plus. As we are now a Special Duty assignment, there are certain qualifications that must be met. If you have any questions or concerns, please just call us here at the ADL, and we can provide whatever information you need. You can also fax your application directly to us, (DSN 834-1605) and we will forward to HQ USAFA/DPAA. The requirements and other details can be accessed by going to:
http://afas.afpc.randolph.af.mil/jobs/eplus_gr.htm

Also, the new CFETP is out. You can access it by going to:
http://sg-www.satx.disa.mil/afdental/

Go to: a - Hot Topics
b - USAF Dental Service Guides
c - 4y0x2

Tips from the Technicians

Compiled by SrA Ann Morris

Here at the Peterson ADL, we have many outstanding dental laboratory technicians who have many great ideas, and we thought it would be a shame to keep these ideas to ourselves! So we would like to share these techniques with you! If you have any ideas you feel others can benefit from, please contact me at DSN 834-1608, and we will try to get them into our newsletter.

■ *Contributed by TSgt Elisha Cumbie and Mr. Terry Winn:* When luting wax bridges together, use Zapit to prevent rocking. Wax can shrink or expand your restoration before your investment sets up. IMPORTANT: Do not spray the accelerator on the wax pattern since it can break down the wax. Instead, drop a small amount of the accelerator directly on the Zap-it.

■ *Contributed by SSgt Mike Buszka:* Use a dry erase marker on your die when you are seating your crown. The dry erase marker will come off easily and will only show the true high areas.

■ *Contributed by SSgt Conrad McCloskey and SrA John Donaldson:* To prevent solder from overflowing when soldering full gold appliances, paint a barrier with a mixture of Zapit accelerator and Rouge. This will come off easily when polishing.

■ *Contributed by Mr. Ron Hill:* When pindexing a cast, the prescribed length of a die (from the base to the bottom of the margin) should be 6-12 mm. When the dies are too long, they become unstable and cause a slight rock.

■ *Contributed by SSgt Conrad McCloskey:* When you are casting Olympia (Jelenko) type metal and notice contamination in your melt, sweep a carbon rod through the metal. IMPORTANT: Do not use pencil lead because modern pencil lead is polymer-based instead of clay-based. Polymer-based pencils have a tendency to shatter when they get too hot. (NEY makes carbon rods).

Peterson ADL Web Page On-Line!

The Peterson ADL web page is now on-line! Still under construction, we are currently posting submission standards, product lines, and turnaround times. A special feature is the display of case status reports. We will update our web page report detailing when we received your cases, what stage of fabrication they are in (wax-up, casting, finishing, etc.) and when they were shipped. The intent is to keep you informed on the progress of your cases and aid in the scheduling of your patients in anticipation of the prosthesis arrival. You can also find copies of the ADL Newsletter and information about upcoming Workshops on the web page. The page can be found under the United States Air Force Academy 10th Medical Group home page. The address is:

http://www.usafa.af.mil/sg/adl/default.htm

PTC Teaches Dental Laboratory Technology Course at ADL

Productivity Training Corporation (PTC) founder John C. Ness, CDT recently visited the Peterson ADL to provide an intensive technical management training course to our team leaders and key technicians within the fixed department. The goal was to provide our ADL the management and technical training to develop middle management skills to grow with maximum quality and efficiency.

The three-day PTC management and hands-on program addressed all aspects of establishing and maintaining a laboratory's high quality technical product. Called the PTC Skill Learning Systems®, this course, in addition to 3 cycles of hands-on experience under PTC supervision, teaches our supervisors not only how to use the systems, but also how to teach them effectively.

TSgt Michael Cumbie, our Director of Training and Education, is responsible for the on-going training of our other technicians. His training is based on using the PTC Training Verification System 2000™, which is composed of 31 video training programs, 9 technical management manuals, standard support materials and special instruments. The verification skill drills, along with close supervision by PTC staff of all course work, ensures that quality production is maintained consistent with our technical policy standards. Our trained supervisors then perpetuate and maintain the ADL's technology.

We believe this training will help raise quality, consistency, efficiency and productivity of our ADL. Please continue to let us know how we're doing! For further information on this training program, please contact TSgt Michael Cumbie.

michael.cumbie@peterson.af.mil

PTC founder John Ness (center) with ADL NCOIC of Training and Education TSgt Michael Cumbie (left) and ADL Flight Commander Col Douglas Evans (right).

E-mail Address Update

Please be sure to include your e-mail addresses on the DD Form 2322 when submitting your cases. Sometimes we have questions concerning your case and are unable to connect with you by telephone due to patient treatment, TDYs, leave, exercises, etc. E-mail is a reliable method to communicate with you, especially those of you at overseas facilities. Thanks for your support!

Federal-Express Contract

The Peterson ADL has recently contracted the mailing of all our outgoing cases through Federal-Express starting 15 Feb 00. Our contract is for Priority Overnight delivery from our facility to yours. However,

Fed-Ex requires the physical address of your facility for all shipping. **If you are sending us cases from overseas, please be sure to send us your physical facility address for door-to-door Federal Express shipping**. If you only give us an APO address for example, Federal Express will ship to San Francisco and then the military postal system will take over. This will likely cause delays in you receiving your case.

Peterson ADL Workshop Update

The ADL Workshop held 2-4 November 99 was a huge success! Many thanks go to all the attendees who made the trip to Colorado Springs for the event. A special thanks goes to all the outstanding presenters and the behind the scenes staff that made it all possible!

The next Workshop is already planned for 13-15 Feb 2001! Please mark your calendars and budget now! We plan on having another superb venue of lecture presentations, hand-on courses, and commercial exhibits. We look forward to seeing you here in '01!

Metal-Free Esthetic Posts

Are you interested in placing an all-ceramic crown on an endodontically treated tooth…. but don't want the traditional gold or base metal post and core to show through the crown and ruin the esthetics? To help correct this problem, the Peterson ADL is now offering the CosmoPost (Ivoclar North America), a zirconium oxide tapered post. It is white and thus eliminates the gray shadow of metal or even carbon fiber posts for optimum esthetics. The CosmoPost is indicated especially for all-ceramic crowns such as IPS Empress (Ivoclar North America), and is reported to have high flexural strength. The CosmoPost is waxed to and then pressed with the new IPS Empress Cosmo Ingot for a one-piece esthetic post and core.

If you request a CosmoPost, please provide a final impression and solid master cast for indirect fabrication. Direct patterns cannot be used in this technique.

Certified Dental Technician Examination Update

We are in the process of organizing a Certified Dental Technician (CDT) National Board Practical Examination at the Peterson ADL. The tentative test date is 17 February 2001 following the ADL Workshop. As you may know, Certification is a national testing and standard-setting program established by and for those practicing in dental laboratory technology. The Board Examination is composed of three parts, the comprehensive, written and practical examinations

The practical portion is a five-hour, in-laboratory examination testing technician abilities in procedures commonly associated with practice in a selected specialty. Eligibility for CDT testing expires four years from the date you passed the Comprehensive examination. Overseas waivers for the four-year expiration date are given through the National Association of Dental Laboratories (NADL). For waivers, contact the NADL home office through e-mail at nadl@nadl.org or through the NADL web site http://www.nadl.org

If you are interested in challenging the CDT practical examination, please contact Col Doug Evans or SSgt Robert Guttierrez. We need 20 candidates in order to host an examination. So please get in touch with us if you are interested!

Current Case Turnaround Time as of 25 February 00

1. Acrylic Section – 6-8 duty days
2. RPD Section – 10-14 duty days
3. FPD Section – 10-14 duty days

Please call for Rush cases and other special needs.

For planning purposes, please note these are "in-house" turnaround ranges, and do not reflect case transit time. As mentioned earlier, we have recently contracted with Federal Express for Overnight return delivery to you. Similar guaranteed shipping from your facility will allow you to accurately project scheduling dates for your patient.

As always, we appreciate your business!

ADL Hail and Farewells!

Arrivals:

Colonel Douglas Evans is the new Area Dental Laboratory Flight Commander and arrived from Kadena AB, Okinawa. He received his Doctor of Dental Surgery degree from The Ohio State University College of Dentistry, a certificate in Prosthodontics from Wilford Hall Medical Center at Lackland AFB, and a Master of Science in Prosthodontics degree from The University of Texas Health Science Center at San Antonio. Dr. Evans also completed a Dental Materials Research Fellowship at The University of Michigan in 1996. Col Evans is a Diplomate of the American Board of Prosthodontics.
SSgt Stephen Alvers arrived from Scott AFB, IL
SSgt Olen Moore arrived from McChord AFB, WA
SSgt Anthony Rangel arrived from Sheppard AFB TX
SSgt Teres Cooksey arrived from Sheppard AFB, TX
SrA Robert Gutierrez arrived from Dyess AFB, TX

Departures:

SSgt Nicholas Brookins, - Separated in December 2000
TSgt Sengpeth Posarath – PCS'd to Hickam AFB, HI in January 2000
SSgt Wesley Erickson – Separated in February 2000
Projected Departures:

SSgt Amy Wagner will separate in March 2000
SSgt Mark Smith will separate in April 2000

Peterson Area Dental Laboratory Key Personnel

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//*Signed*//

DOUGLAS B. EVANS, Col, USAF, DC
Area Dental Laboratory Flight Commander
10 DS, Peterson AFB, Colorado

//*Approved*//

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